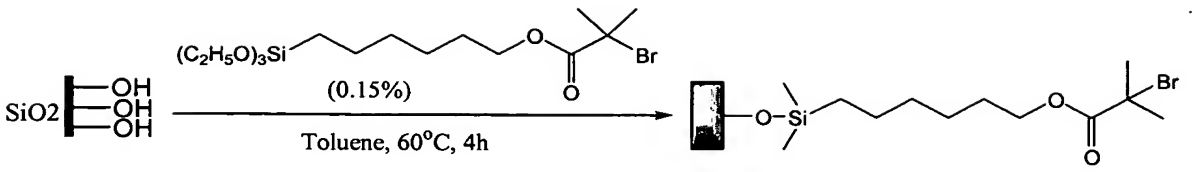


Figure 1: Initiator Molecule Self-assembled into a Monolayer on a Surface.

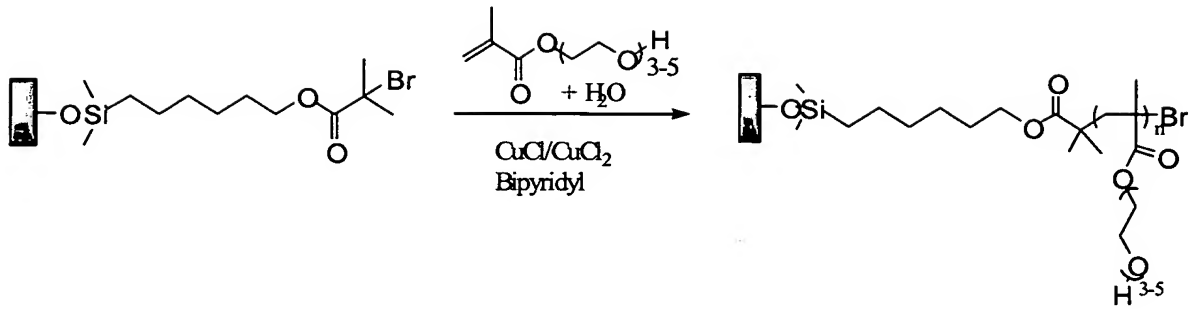


Figure 2: Growing PEGAA Films on a Substrate Using Surface Atom Transfer Radical Polymerization.

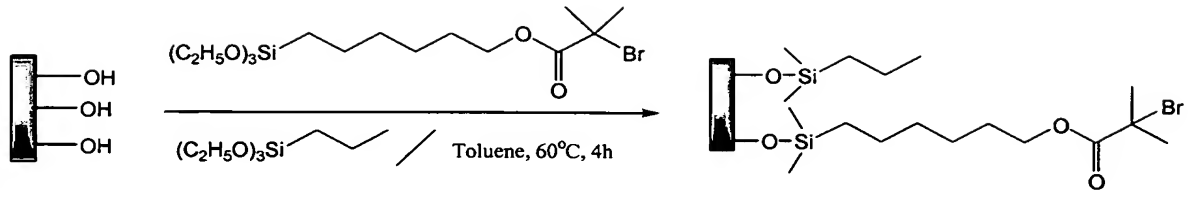


Figure 3: Self-assembly of a Monolayer Containing Initiator and Spacer Molecules onto the Surface of a Substrate.

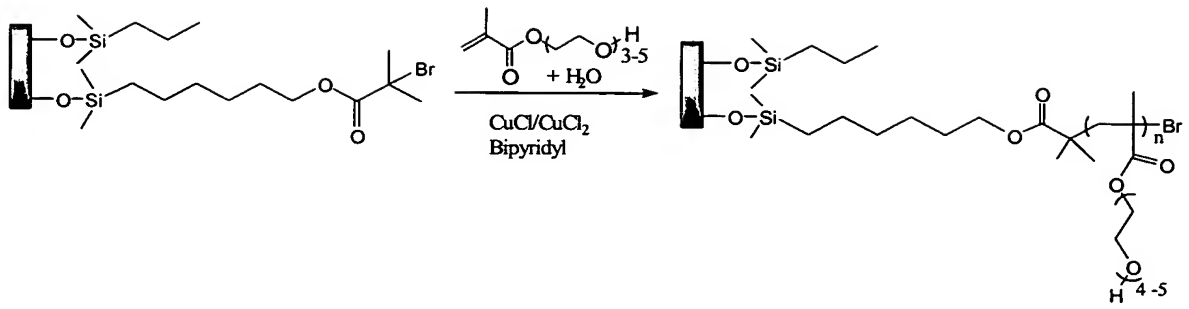
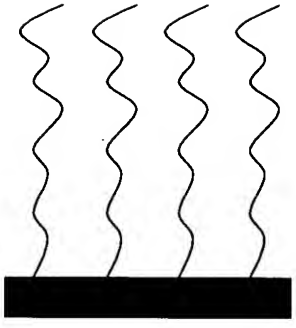


Figure 4: Bonding of PEGAA Polymer Chains to the Initiator Molecules Contained in a SAM Comprised of Both Initiator and Spacer Molecules.



Surface ATRP

5a

Macromolecule self-assembling method

5b

Figure 5a: PEGAA Polymer Chains Vertically Grown in Accordance with the SATRP Process of the Invention.

Figure 5b: Random Coil Deposition of Polymer Chains in Accordance with the Self-assembling Technique of Chapman et al.

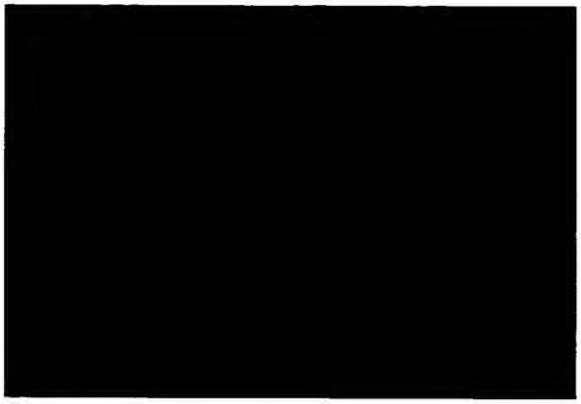


Figure 6: E. Coli Cell Adsorption on a Silica Wafer Prepared in Accordance with Example 11. No E. Coli Cells Were Observed Adhering to the Silica Wafer Substrate (20x image).

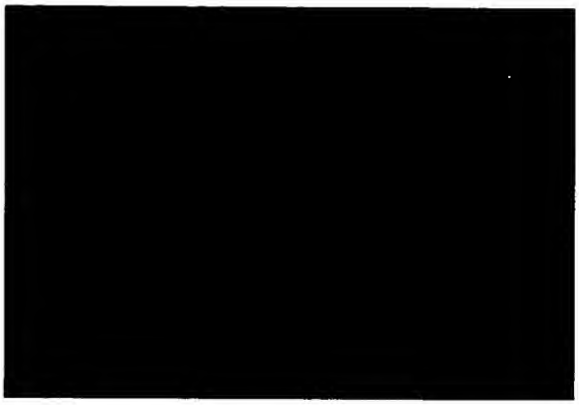
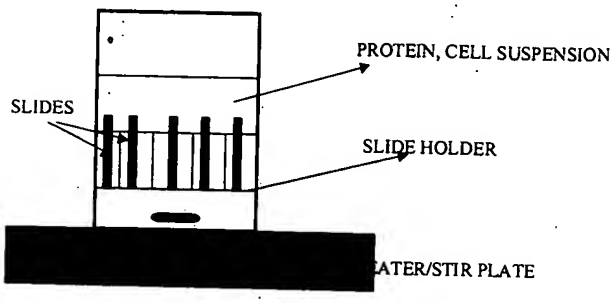


Figure 9: E. Coli Cell Adsorption on a Silicon Wafer Coated with a 20 nm Thick PEGM Polymer Layer in Accordance with the Process of Example 5. No E. Coli Cells were Observed Adhering to the Silica Wafer Substrate (20X Image).

Schematic of a test cell for protein & cell binding experiments



For any given condition, we simulate two states
A. Protein level built up on surface (load)
B. Irreversible protein level remaining on a surface (desorb)

Figure 10: Schematic of Test Cell for Protein and Cell Binding Experiments.

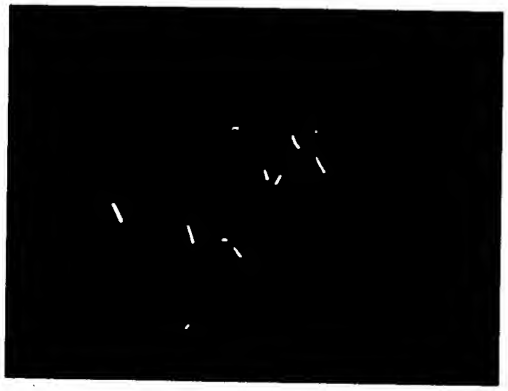


Figure 8: E. Coli Cell Adsorption on a Silicon Wafer Coated with the Initiator Monolayer of Example 4. E. Coli Cells Were seen Densely Binding to the Initiator Monolayer Grown on the Silica Substrate (100X Image).

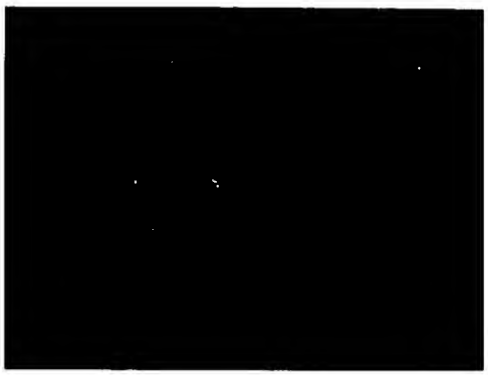


Figure 7: E. Coli Cell Adsorption on a Silicon Wafer Coated with the Initiator Monolayer of Example 4. E. Coli Cells Were Seen Densely Binding to the Initiator Monolayer Grown on Silica Substrate (20X Image).

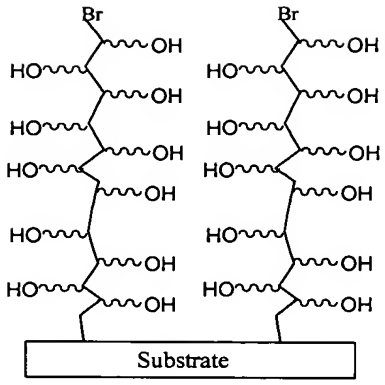
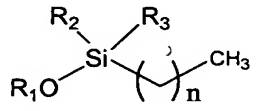


Figure 11: Cartoon Depicting Chemical Group(s) Attached to the Surface of Polymer Chains Grown on a Substrate.

Figure 12: Exemplary Spacer Molecules.

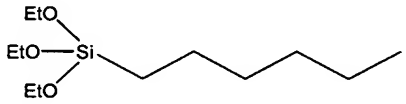
a) An alkyl chain such as:

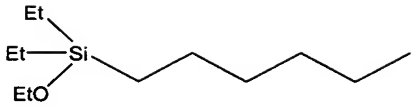
1. Alkyoxyl silanes with alkyl chains



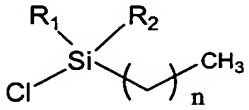
R_1 = CH_3, C_2H_5, or alkyl group
R_2 = CH_3, C_2H_5, alkyl group, or OR_1
R_3= CH_3, C_2H_5, alkyl group, or OR_1
n = 1 to 50

For Example:



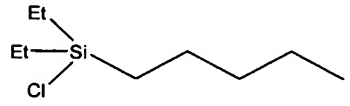


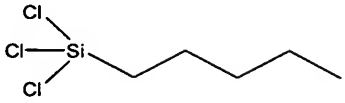
2) chlorosilanes with alkyl chains



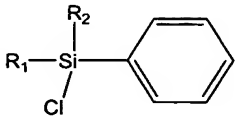
R_1 = Cl, CH_3, C_2H_5, or alkyl group
R_2 = Cl, CH_3, C_2H_5, or alkyl group
n = 1 to 50

For example:



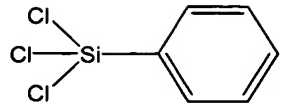


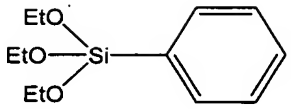
b) Phenyl and its derivatives

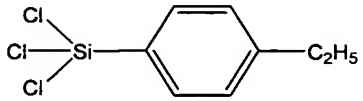


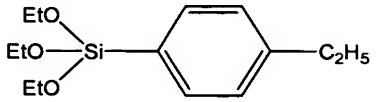
R_1 = Cl, CH_3, C_2H_5, or alkyl group
R_2 = Cl, CH_3, C_2H_5, or alkyl group

For example:

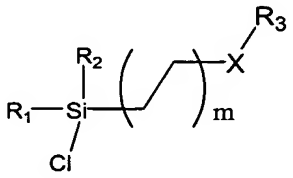








c) A mixture of an alkyl chain and functional groups, for example:



R1 = Cl, CH_3, C_2H_5, or alkyl group
R2 = Cl, CH_3, C_2H_5, or alkyl group
R3 = alkyl group, phenyl, -OH, $-NH_2$, etc.
X = O, COO, CONH, etc.
m = 1 to 50

For example: